



Mu Sigma

Thursday Learning Hour – Graph ML

Introduction to Graph Theory and Basics of Graph ML

Do The Math

Chicago, IL

Bangalore, India

www.mu-sigma.com

15th September 2022

I went to a party with my wife. Four other couples were there in the party. Each person shook the hands of a person they didn't know. Then, I went to the centre stage and said

“ On a chit of paper write the number of persons you shook hands with”.

(Cleverly, I did not participate)

On scrutiny, I discovered that no two answer were same. All numbers from 0 to 8 were there.

Assume that all of them gave their correct answer.

Help me out to find: How many people my wife didn't know, of course, without her knowing about by spy work

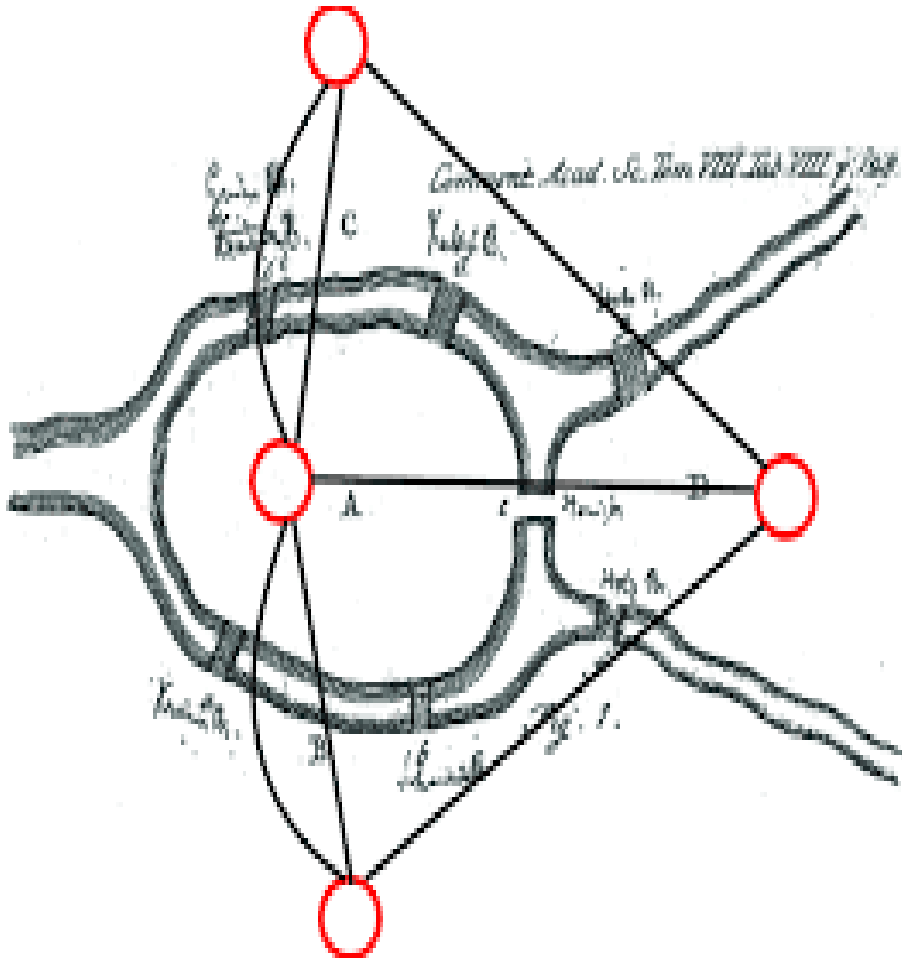
Which is more important?

- (a) Nodes
- (b) Edges
- (c) The entire graph
- (d) Sub- graphs

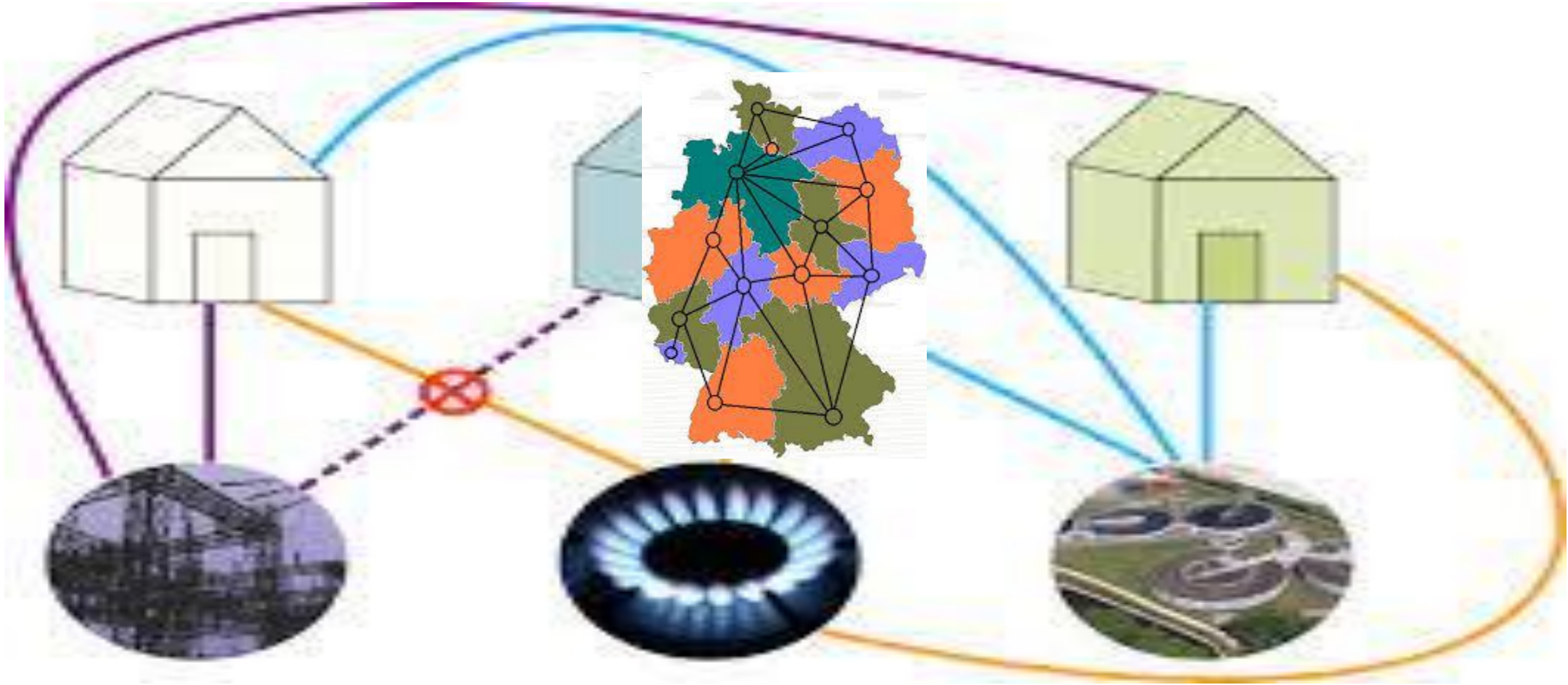
Seven Bridges of Königsberg



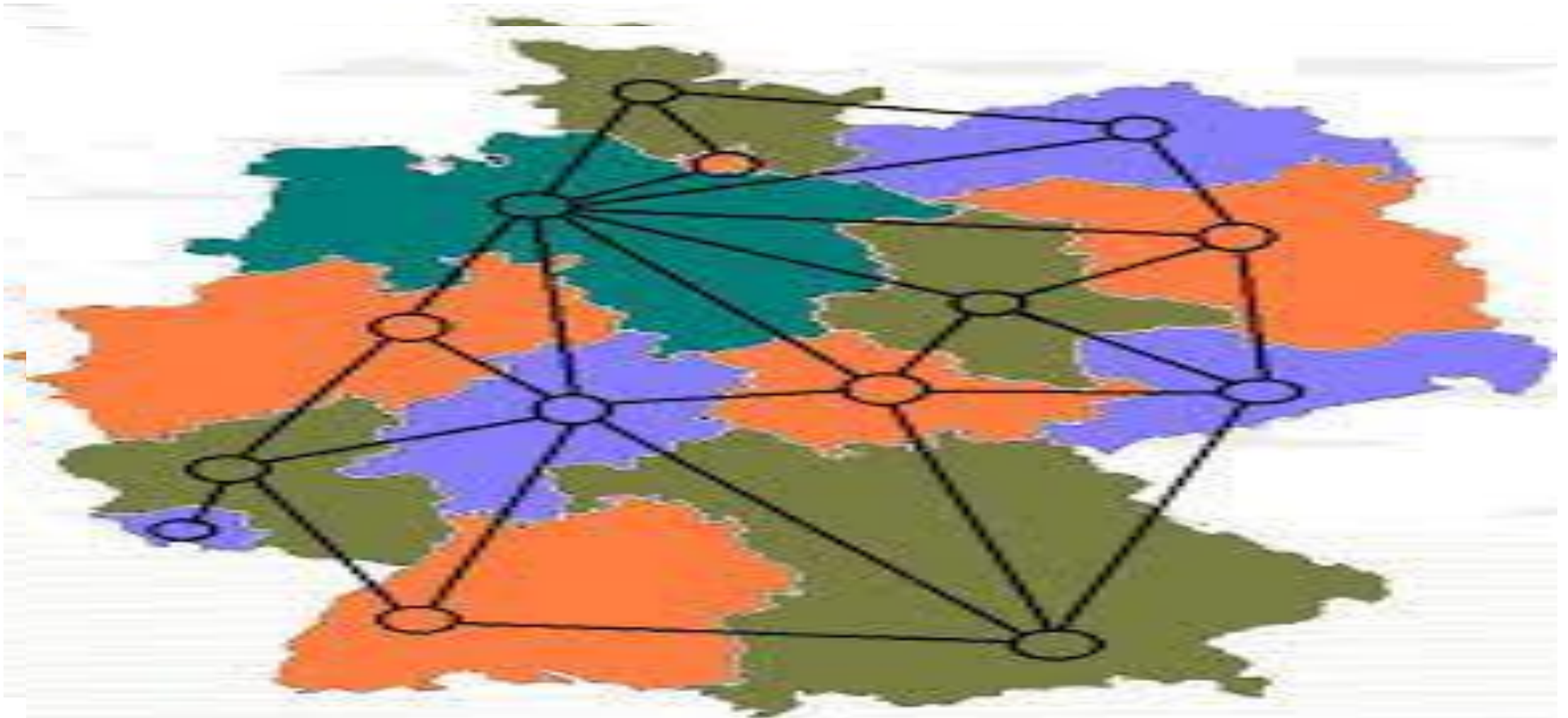
Mu Sigma



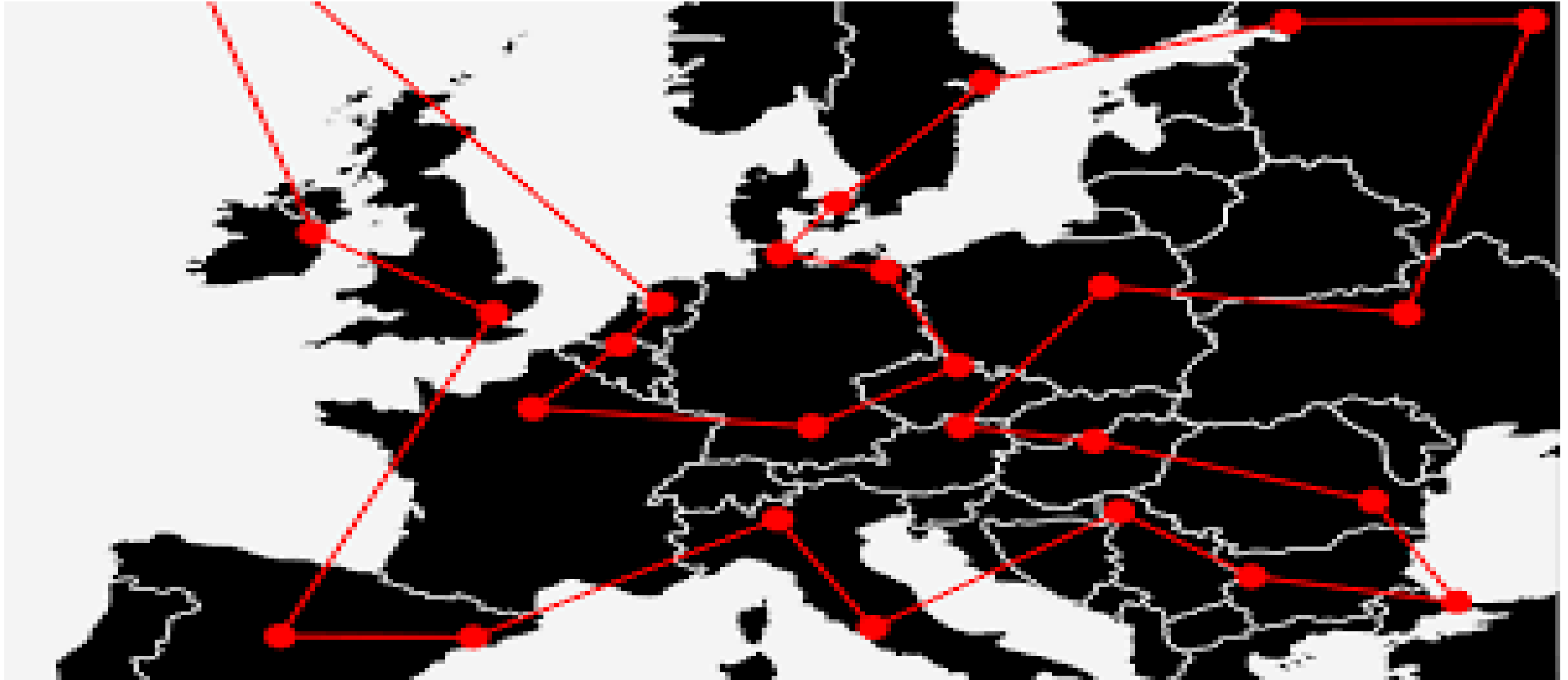
Utility problem



Four Colour Theorem



Traveling Salesman problem



Which is more important?

- (a) Nodes
- (b) Edges
- (c) The entire graph
- (d) Sub- graphs

How to solve it?



Mu Sigma

In how many ways can 6 letters be posted in 4 letter boxes.

- (a) 6×4
- (b) P_4^6
- (c) C_4^6
- (d) $6! \times 4!$
- (e) 6^4
- (f) 4^6



Imagine the situation

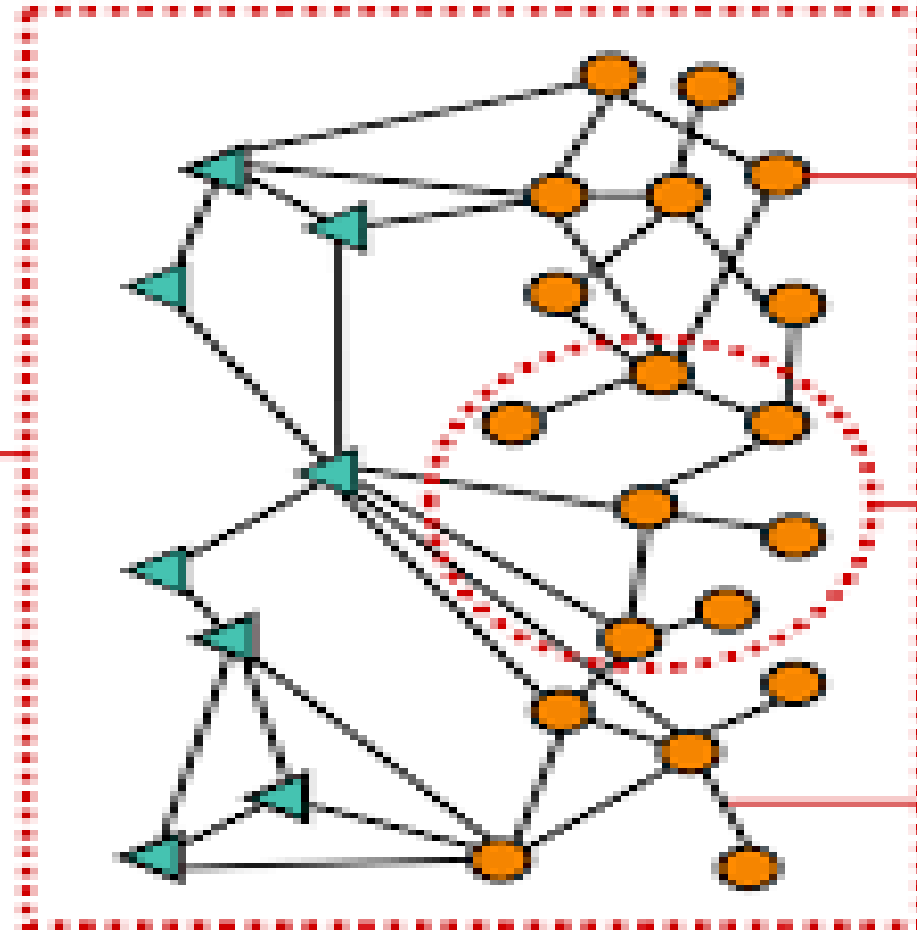


Mu Sigma



Which is more important

**Graph-level
prediction,
Graph
generation**

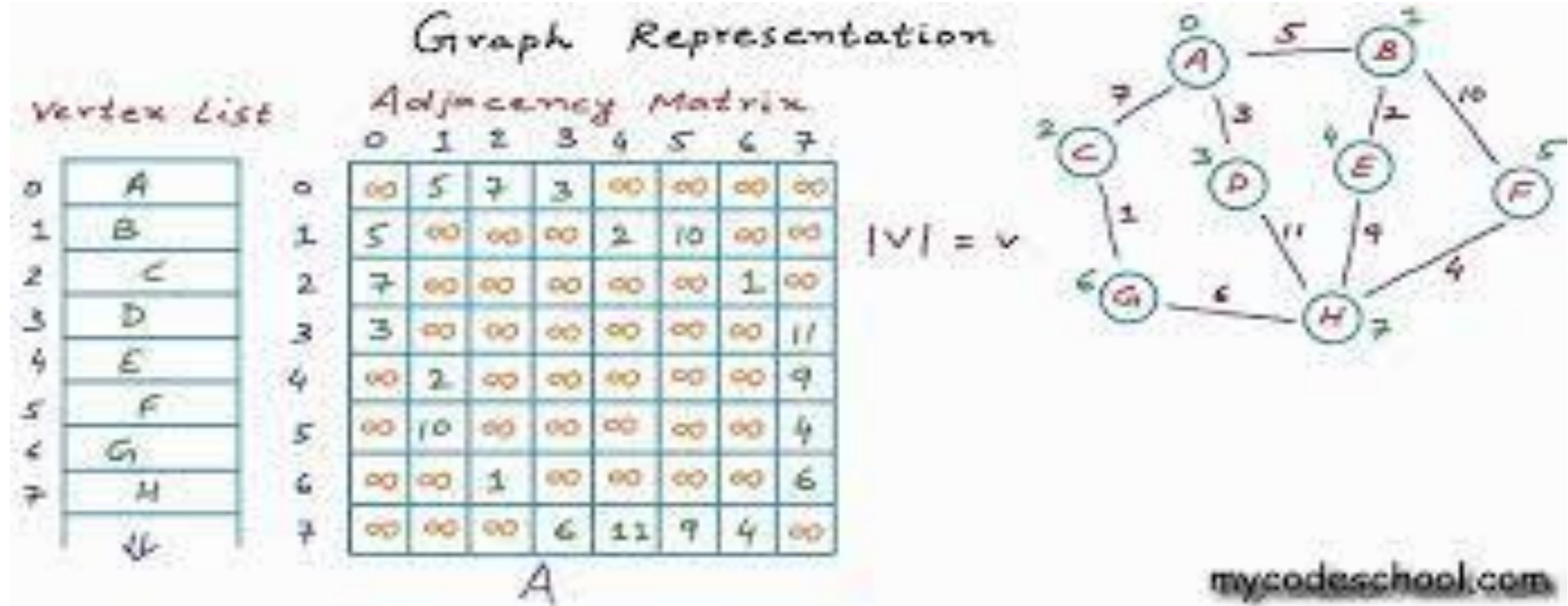


Node level

**Community
(subgraph)
level**

Edge-level

Representation





Thank you